

IN THE CLAIMS

1-12 (canceled).

13 (currently amended): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:

for rotating
a rotational member (to allow) an article held in the end effector (to rotate) around an axis passing through the article; and

a device for pressing the article against the rotational member to hold the article in the end effector and cause the article to rotate (no antecedent basis for this function when the rotational member rotates in the end effector)

wherein the article has a first, substantially planar, surface facing the rotational member and a second, substantially planar, surface opposite to the first surface, and the end effector contacts the first surface of the article but not the second surface of the article when the device presses the article against the rotational member.

14 (canceled).

15 (currently amended): The apparatus of Claim 14

An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising a rotational member (to allow) an article held in the end effector (to rotate) around an axis passing through the article;

wherein the end effector further comprises: a body to which the member is coupled and around which the member is rotational; and

a device for pressing the article against the member when the end effector is holding the article;

wherein the device comprises a vortex chuck to emit a gas vortex towards the article.

16 (previously presented): The apparatus of Claim 15 wherein the vortex chuck is mounted in the body.

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17 (currently amended): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising a rotational member for contacting the article held in the end effector and for rotating the article, wherein both the rotational member and the article rotate around an axis passing through the article when the rotational member rotates the article.

~~a mechanism for holding an article and rotating the article around an axis passing through the end effector.~~

18 (currently amended): The apparatus of Claim 17 wherein the end effector further comprises :a rotational body; and a device for pressing the article against the body rotational member when the end effector is holding the article.

19 (currently amended): The apparatus of Claim 17

An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different

stations, the end effector comprising a mechanism for holding an article and rotating the article around an axis passing through the end effector;

wherein (the device) comprises a vortex chuck to emit a gas vortex towards the article.

20 (previously presented): The apparatus of Claim 19 wherein the vortex chuck is mounted in the body.

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Claims 21-24 (cancelled).

25 (currently amended): The apparatus of Claim 13 wherein the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and

in addition to being rotatable around the body, the member is movable relative to the body in a direction transversal to opposite from the article, the member yielding to yield when the article is held in the end effector and the end effector presses the second surface of the article against a third surface not belonging to the article and not belonging to the end effector.

26 (currently amended): The apparatus of Claim 25 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against [[a]] the third surface.

27 (previously presented): The apparatus of Claim 13 wherein the articles are semiconductor wafers.

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28 (previously presented): The apparatus of Claim 13 wherein the different stations include one or more of: a wafer storage cassette, a wafer shipment container, an etching station, a deposition station, a film frame machine for attaching adhesive film frames to wafers, a dicing station.

29 (previously presented): The apparatus of Claim 13 further comprising a robot comprising an arm to which the end effector is attached.

30 (previously presented): The apparatus of Claim 13 wherein the apparatus is programmed to:

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pick up an article by the end effector from a first station;
carry the article to a second station to perform a rotational orientation of the article in the end effector without the end effector releasing the article; and
after the rotational orientation, carry the article in the end effector to a third station.

31 (previously presented): The apparatus of Claim 30 wherein the apparatus is programmed to place the article at the third station, the article remaining in the end effector from the time the article was picked up at the first station and up to the time the article is placed at the third station.

32 (previously presented): The apparatus of Claim 17 wherein the articles are semiconductor wafers.

33 (previously presented): The apparatus of Claim 17 wherein the different stations include one or more of: a wafer storage cassette, a wafer shipment container, an etching

station, a deposition station, a film frame machine for attaching adhesive film frames to wafers, a dicing station.

34 (previously presented): The apparatus of Claim 17 further comprising a robot comprising an arm to which the end effector is attached.

35 (previously presented): The apparatus of Claim 17 wherein the apparatus is programmed to:

pick up an article by the end effector from a first station;

carry the article to a second station to perform a rotational orientation of the article in the end effector without the end effector releasing the article; and

after the rotational orientation, carry the article in the end effector to a third station.

36 (previously presented): The apparatus of Claim 35 wherein the apparatus is programmed to place the article at the third station, the article remaining in the end effector from the time the article was picked up at the first station and up to the time the article is placed at the third station.

37 (new): The apparatus of Claim 13 wherein the device emits a gas flow that flows towards the article through an opening in the end effector to draw the article towards the end effector.

38 (new): The apparatus of Claim 15 wherein the member is movable relative to the body in a direction opposite from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

39 (new): The apparatus of Claim 38 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the end effector is holding the article and is pressing the article against the surface not belonging to the article and not belonging to the end effector.

40 (new): The apparatus of Claim 17 further comprising a device for emitting a gas flow that flows towards the article through an opening in the end effector to draw the article towards the end effector

B | 41 (new): The apparatus of Claim 17 wherein the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and

the member is movable relative to the body in a direction opposite from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

42 (new): The apparatus of Claim 41 wherein the end effector further comprises a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

43 (new): The apparatus of Claim 19 wherein the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and

the member is movable relative to the body in a direction opposite from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

44 (new): The apparatus of Claim 43 wherein the end effector further comprises a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

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45 (new): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising a rotational member for contacting the article held in the end effector and for rotating the article around an axis passing through the article, the rotating article being stationary relative to the rotational member.

46 (new): The apparatus of Claim 45 wherein the end effector further comprises a body to which the member is coupled and around which the member is rotatable; and

the member is movable relative to the body in a direction opposite from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

47 (new): The apparatus of Claim 46 wherein the end effector further comprises a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield

when the article is pressed against the surface not belonging to the article and not belonging to the end effector.

48 (new): The apparatus of Claim 45 wherein the articles are semiconductor wafers.

49 (new): An apparatus comprising an end effector for transporting articles between different stations, the end effector holding an article as the article is being transported between different stations, the end effector comprising:

a body;

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a rotational member coupled to the body and rotatable around the body, for contacting the article held in the end effector and for rotating the article around an axis passing through the article; and

a device for pressing the article against the rotational member;

wherein the member is movable relative to the body in a direction opposite from the article to yield when the end effector is holding the article and is pressing the article against a surface not belonging to the article and not belonging to the end effector.

50 (new): The apparatus of Claim 49 further comprising a spring plate rigidly attached to the body and contacting the member on a side opposite from the article, to prevent uncontrollable rotation of the member and to allow the member to yield when the article is pressed against the surface not belonging to the article and not belonging to the end effector.